release was lower than CoM release, but not significantly different (p=0.067). Both articulating systems, however, showed higher release values than control ($p<0.01$). Hydroxyproline content was significantly increased for CoM compared with CoC (4:1; p=0.041). There was no difference between CoC and control.
Conclusions: A preliminary benchmark has been established, with cartilage-on-cartilage being the superior interface compared with cartilage-on-metal, the current gold standard in cartilage replacement strategies. Since it was shown earlier that the described methodology is capable in indentifying historical failures (e.g. polyethylene), this study further validates the predescribed technique and opens promising testing possibilities for novel artificial materials. Further investigation will follow to analyze the influence of contact load and motion frequency on tissue response.

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HYALURONIC ACID-RELATED VISCOSITY OF THE OSTEOARTHRITIC SYNOVIAL FLUID (SF) IS HIGHLY DEPENDENT ON SF PROTEIN COMPOSITION

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Purpose: The elasto-viscosity of the synovial fluid (SF) is known to be dependent on the product "molecular weight (Mw) x concentration (C)" of hyaluronic acid (HA). However the HA rheological behaviour at the same C and Mw is a Newtonian one at low shear rate while that of LS is non-Newtonian. Furthermore the viscosity of LS is much higher than that of a solution of HA alone at the same C and Mw. This suggest interactions between HA and proteins (Pr) that may influence SF rheological properties.
The aim of the study was to investigate the influence of protein composition (C and Mw) on the SF intrinsic viscosity in patients with knee osteoarthritis (OA)
Methods: 18 SF were obtained by arthrocentesis in patients with knee OA and assayed using Steric Exclusion Chromatography, which allows HA to be separated from the proteins and to determine both Mw and C without any pre-treatment.
SF rheology was determined using a rheometer at 25°C using a cone and plate geometry. Steady-state viscosity η was determined in Pa.s, as a function of the shear rate at 1 s^{-1}.
Correlations between η (Pa·s) and HA and Pr (Mw, C and Mw $\times$ C) were calculated.
Results: The mean HA concentration (SD) and Mw were 1.44 ($\pm$0.5) g/L and 1.57 ($\pm$0.7) $\times$ 10^6 Da respectively. The mean Pr concentration and Mw were 25.9 ($\pm$6.2) g/L and 2.33 ($\pm$1.7) $\times$ 10^6 Da respectively.
Mean η was 0.79 ($\pm$0.81) Pa·s at 1 s^{-1} and was unrelated to Pr Mw and C as well as HA Mw. It was related to HA C (R=0.56, p=0.01) and [HA Mw $\times$ C] (R=0.66, p=0.003).
η was much more highly correlated with the ratio [HA Mw $\times$ C/Pr Mw $\times$ C] (R=0.71, p=0.0009).
Conclusions: LS protein composition influences HA-related viscosity, probably through electrostatic interactions between anionic HA and cationic sites of proteins that form a loose 3D-network.

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RETROGRADE CEMENT REMOVAL IN ELECTIVE TOTAL HIP REVISION SURGERY

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Purpose: Removal of cemented femoral stems in total hip arthroplasty revision is technically demanding and requires a multitude of surgical techniques and tools. To gain full access to the cement, distal fenestration, extended trochanteric osteotomy or a transfemoral approach have been established.
In order to minimize further proximal bone loss we used a retrograde technique to remove the cement from the femoral canal and also to remove the distal part of the stem in case of fatigue breakage. Besides the clinical cases we also report on the results of our biomechanical examinations on cadaver femurs.
Methods: At the University of Szeged, Department of Orthopedics we used the retrograde method for The authors present five clinical cases, where in two cases the femoral stem and cement was removed and in three cases due to breakage of the femoral component the distal part was removed with the retrograde technique. We simulated cement removal with the windowing and the retrograde technique on 12 femurs from cadavers.
Cadavers of similar age and body posture were chosen and divided into two groups. We removed both femurs from the cadavers. In three specimens we made a 1.5cm $\times$ 5cm window on the lateral cortical of the femur. On the other three specimens we opened distally the medullary canal with a 12 mm drill. The other femurs from the same cadavers were used as control.
For the examinations we used an Instron 8874 biaxial material testing unit. After fixing the femur we loaded it axially with a 100 N to further stabilize the system, and then we applied a constant 2°/s rotational force until it broke. We measured the torque required for breakage.
Results: In all cases the removal of the stem or the distal broken part was complications free. The average age of the cadavers from each group was roughly the same.
Where the fenestration technique was used the fracture in every case involved the window. There was a significant difference in the torque required for fracture; the ratio was 1:3 in favor of the control group. In the retrograde technique group the fracture of the femur never occurred in the distal part. The torque required for fracture was only slightly less than in the control group with a ratio 1:1.3. There was not a significant difference in bone quality between the prepared and control femur groups, $p\leq0.804$.
Conclusions: Besides weakening the bone stock the fenestration technique also has other setbacks: The special long femoral stem required after windowing is more expensive than routine stems. When compared to the retrograde approach the fenestration technique requires a larger incision, more muscle detachment which increases both surgical time and blood loss, and with this, the rate of complications also increases.
Our few cases from elective hip revision surgery demonstrate that the retrograde technique besides assisting in stem removal can also be successfully used for removal of the distal femoral component in case of stem breakage.
The cadaver experimentations support our clinical experience that the windowing technique greatly weakens the femur against rotational forces. We are planning to continue our experimentation so later we can report on our results from a greater number of examinations.
In conclusion, taking into account the indications and contraindications of the retrograde cement removal technique we recommend its use as an alternative possibility in elective femoral stem loosening.